

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2004/001449

International filing date (day/month/year)
31.03.2004

Priority date (day/month/year)
01.04.2003

International Patent Classification (IPC) or both national classification and IPC
E21B34/14

Applicant
SPECIALISED PETROLEUM SERVICES GROUP LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2004/001449

Box No. I Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2004/001449

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or
Industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | |
|-------------------------------|-------------|---------------|
| Novelty (N) | Yes: Claims | 1-23,25,28-42 |
| | No: Claims | 24,26,27 |
| Inventive step (IS) | Yes: Claims | 1-23,25,28-42 |
| | No: Claims | 24,26,27 |
| Industrial applicability (IA) | Yes: Claims | 1-42 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/GB04/01449

The examination is being carried out on the following application documents:

Text for the Contracting States:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV MC MK NL PL PT RO SE SI
SK TR

Description, pages: 1-39, as originally filed

Claims, No.: 1-42, as originally filed

Drawings, sheets: 1/7-7/7, as originally filed

**V - Reasoned statement with regard to novelty, inventive step or industrial
applicability; citations and explanations supporting such statement**

The document **D1: WO 02/068793** discloses (see in particular the description on pages 2 and 3) a downhole tool for selectively performing a task in a wellbore, the tool comprising:

a [substantially] cylindrical body having a central bore running axially therethrough, a sleeve located within the bore, the sleeve including a ball seat, a plurality of balls, each ball arresting a majority of fluid flow through the bore when located in the ball seat, mechanical biasing means located between the sleeve and the body to bias the sleeve in a first direction, and functional means on the body to perform a task in the wellbore, the functional means being operable on relative movement of the sleeve, wherein the functional means has at least a first and second operating position, each change in position being effected by passing said ball in a reverse direction, and wherein the said changes form a cyclical pattern such that the functional means can be cycled back to the first operating position.

The subject-matter of **claim 1** differs from this known D1 in that each ball has [substantially] similar dimensions.

The subject-matter of **claim 1** is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention is that of activating and re-activating

a downhole tool with balls landing on a ball seat. As disclosed in the state of the art, a larger deformable ball was used to activate the system while a smaller metal ball followed in order to re-activate. The applicant claims that with two balls of similar dimensions (in this case the term "substantially" is too vague and is therefore not allowable) either of a deformable or non-deformable material, this can still be achieved. Previously, the balls had to be dropped in the correct sequence in order to activate the tool, in this case, any ball can be dropped in order to activate and subsequently re-activate the tool. As each of the documents of the prior art specifically discloses the larger followed by the smaller ball, the subject-matter of **claim 1** would be considered to involve an inventive step only when the applicant defines their relative sizes as being identical. Therefore, **claim 1** meets the requirements of Article 33(3) PCT.

Claims 2 to 23 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Although **claim 24** relates to a method of circulating fluid in a borehole, the method is anticipated by D1 as in the disclosure on pages 5 and 6 and therefore the subject-matter of claim 24 does not meet the requirements of Articles 33(2) and (3) PCT with respect to novelty and inventive step.

However, the additional feature of dropping an **identical** ball (cf. the examiners comments re claim 1) as specified in **claim 25** is considered to be inventive, although the method steps relating to said identical second ball are additionally disclosed in D1. The subject-matter of **claims 26 and 27** is also disclosed in D1 and is therefore not novel, but as the subject-matter of **claims 28 to 31** is not disclosed in any of the documents of the prior art, said claims meet the requirements of the PCT with respect to inventive step. Of particular importance, these claims relate to a method of arresting the movement of the balls in the tool, stopping the balls in a second ball seat and catching the balls before they exit the tool.

Claims 32 to 35 relate to a ball arrester and a ball seat for use with the apparatus of claim 1 and in the method of claim 24 (in combination with claim 25). The inventive concept behind these groups of claims appears to be the avoidance of damage to the balls as they are passed through the system and the provision of a deformable seat in order to allow identical-sized balls through without damage to the seat. Therefore, as

these sets of claims also relate to the overall problem to be solved of an easily operatable tool, **claims 32 to 35** meet the corresponding requirements of the PCT with respect to novelty and inventive step.

Claims 36 to 42 relate to an actuating mechanism for a downhole tool whereby retaining the ball or allowing the ball to be arrested in the tool causes the sleeve to move in the reverse direction and to therefore re-activate the tool. Said claims are also considered to be part of the overall inventive concept of the invention and as such also meet the requirements of the PCT with respect to novelty and inventive step.